(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 039 695 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
27.09.2000 Bulletin 2000/39

(51) Int. Cl.[7]: **H04L 12/28**, G06F 13/40

(21) Application number: **00200981.9**

(22) Date of filing: **17.03.2000**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **19.03.1999 NL 1011599**

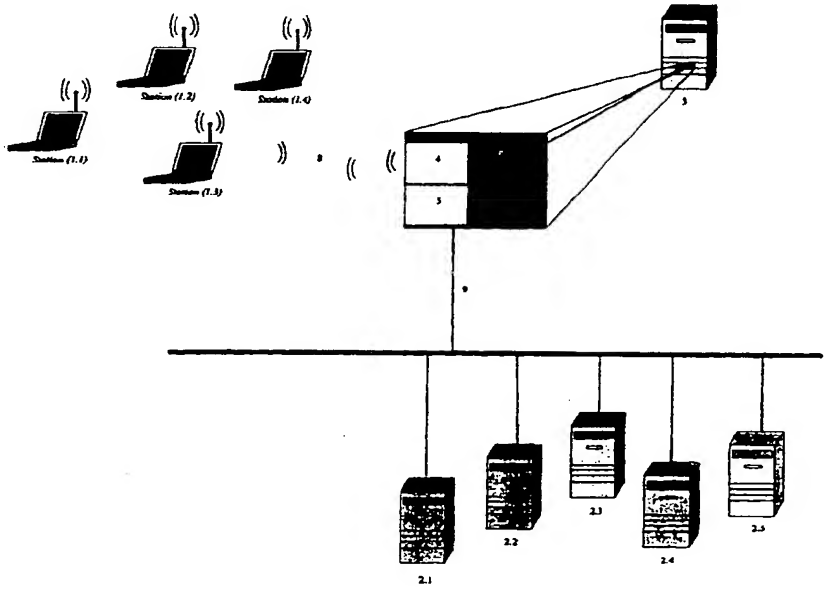
(71) Applicant: **No Wires Needed B.V.**
3723 BG Bilthoven (NL)

(72) Inventors:
- **Brockmann, Ronald Alexander**
  3572 AX Utrecht (NL)
- **Zwemmer, Arnoud Roderick**
  3581 AE Utrecht (NL)
- **Hoeben, Maarten**
  3706 HW Zeist (NL)

(74) Representative:
Van Breda, Jacobus
Octrooibureau Los & Stigter B.V.,
P.O. Box 20052
1000 HB Amsterdam (NL)

(54) Interface card and computer provided with such an interface card

(57) The invention relates to an interface card suitable for installation in a computer for obtaining a data connection channel with a network in which one or more computers are incorporated. The card incorporates a combination of at least: a first adaptor suitable for connecting to a wireless network; a second adaptor suitable for connecting to a wired network; and a microcontroller which, depending on the data traffic present on the first or the second adaptor, services a circuit to provide the data connection channel between the first and the second adaptor, respectively, and the computer in which the card is incorporated.



EP 1 039 695 A1

Description

[0001] The invention relates to an interface card suitable for installation in a computer for obtaining a data connection channel with a network in which one or more other computers are incorporated.

[0002] Such an interface card is known in practice and two types have long since existed, namely a first type that serves for connecting the computer to a wireless network, and a second type for connecting the computer to a wired network. Both types have their pros and cons. The wireless network suffers the drawback of a limited bandwidth which in turn limits the data transmission rate. With the wired network much higher rates of data transmission can be achieved, up to a factor of 10 to 100 higher than in the wireless network. However, the advantage of using a wireless network is that a user can quickly connect to the network and become active, while in addition mobility and flexibility are provided which a wired network lacks. When setting up a computer network it is usual to choose one of these two types with the inherent andvantages and disadvantages.

[0003] It is the object of the invention to combine the advantages of both types of networks avoiding as much as possible the disadvantages of these types of networks.

[0004] To this end the interface card according to the invention is characterized in that the card incorporates a combination of at least: a first adaptor suitable for connecting to a wireless network; a second adaptor suitable for connecting to a wired network; and a microcontroller which, depending on the data traffic present on the first or the second adaptor, services a circuit to provide the data connection channel between the first and the second adaptor, respectively, and the computer in which the card is incorporated. In this manner the interface card, without the user being aware of it, automatically provides the most suitable data connection channel, thereby optimally meeting the requirements at any particular moment with respect to the possibilities and the needs the user may have when using the computer that is incorporated in the respective network.

[0005] Compared with the prior art, this provides the advantage that a particular link of the computer in which the card is incorporated with the respective network is ensured, and that no modifications are necessary to the computer, the software, or other network components when changing to another type of network from wireless to wired or vice versa.

[0006] This offers the possibility of extensive uniformization in the equipment of the computers incorporated in the network, while in addition an optimal distribution can be achieved between the capital outlay necessary for the installation of a wired network, and the capital outlay for the similtaneous realization of a wireless network.

[0007] Advantageously the microcontroller services at least a circuit for the provision of the data connection channel between the second adaptor and the computer in which the card is incorporated, when data traffic is present on both the first and the second adaptor. This affords the advantage, if the situation permits it, to automatically unload the wireless network by switching into the wired network of the computer in which the interface card is incorporated, thereby providing the additional advantage that the computer incorporated in the wired network is able to work at higher data transmission rates.

[0008] An embodiment of the data card that sometimes enjoys preference, is characterized in that the microcontroller services two separate data connection channels between the first and the second adaptor, respectively, and the computer in which the card is incorporated, when data traffic is present on both the first and the second adaptor. By this measure it is possible to achieve advantages that will be explained in the description below relating to a computer in which the interface card is incorporated.

[0009] The invention is also embodied in such a computer that is provided with an interface card as described above. According to the invention, said computer is characterized in that it is incorporated in a wireless local area network (LAN), wherein the first adaptor on the interface card is switched to provide the data connection channel to said LAN, and the second adaptor is switched to provide a further data connection channel to a wired network.

[0010] In this manner the computer is able to communicate simultaneously both with the wireless and the wired network. Conveniently the computer is then designed such as to be connected as access point for the wireless local area network. The other computers incorporated in the wireless local area network are then also connected with the computers incorporated in the wired network via the computer that is connected as access point.

[0011] As generally important advantage of the invention may be mentioned that, by using the interface card according to the invention it is possible to postpone the definite decision regarding the type of network, whether wireless or wired, into which the computers that are provided with such an interface card, are to be incorporated. In addition, during use on real-time basis, that is to say during data transport, and depending on the situational conditions, the interface card is capable of switching the computer's coupling with the wired network over to coupling with the wireless network and vice versa. If the microcontroller incorporated on the interface card controls effectively, the data traffic can as much as possible take place via the wired network to releave the wireless network, which will benefit the perfomance of the entire network system.

[0012] The invention finally makes it possible to flexibly implement the interoperability of wireless and wired networks, while in addition creating the possibility of saving costs when realizing the wireless network, due

to the fact that computers equipped with an interface card in accordance to the invention, are capable of functioning as access point for the wireless network.

[0013] The invention will now be explained in more detail with reference to one single exemplary embodiment of a combined wireless and wired network, incorporated into which is a computer provided with the interface card according to the invention.

[0014] The figure represents a wireless network 1, of which computers 1.1, 1.2, 1.3 and 1.4 are components intercommunicating via the ether. The figure also shows a wired network 2, of which computers 2.1, 2.2, 2.3, 2.4 and 2.5 are components interconnected in a ringnet. Other network structures are also possible for this purpose. The figure further shows a computer 3, which is both a component of the wireless network 1 by means of a wireless connecting channel 8, and of the wired network 2 by means of a wired data connection channel 9. The wireless data connection channel 8 is connected to a first adaptor 4 which is included on an interface card 10 according to the invention. This interface card 10 is incorporated in the computer 3 and has in addition a second adaptor 5 to which the second data connection channel 9 is connected. The first or second adaptor 4, 5, communicates with the computer 3 under the control of a microcontroller 6 which is part of the interface card 10. In the configuration shown in the figure, the computer 3 functions as access point for the wireless local area network 1, and thereby provides the computers 1.1, 1.2, 1.3 and 1.4 which are part of this wireless network 1, with access to the wired network 2.

[0015] To the expert it will be obvious that the description of the exemplary embodiment is only one of the possibilities provided with the interface card according to the invention, and that the invention is not limited to this exemplary embodiment. Other variations and possible applications are also conceivable without departing from the idea of the invention defined in the appended claims which have been elucidated in the above specification.

Claims

1. An interface card suitable for installation in a computer for obtaining a data connection channel with a network in which one or more other computers are incorporated, **characterized in that** the card incorporates a combination of at least:

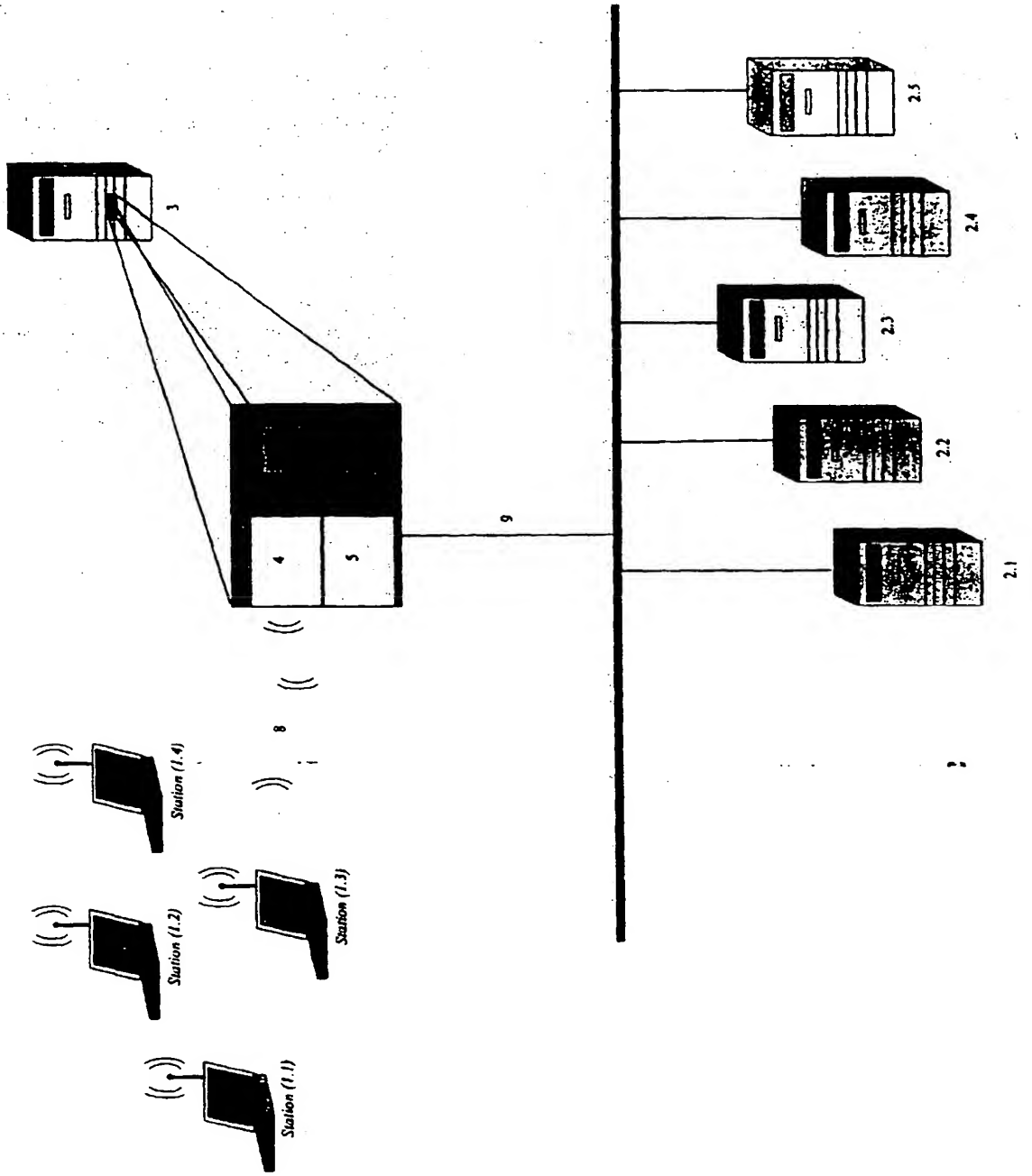
   - a first adaptor (4) suitable for connecting to a wireless network (1);
   - a second adaptor (5) suitable for connecting to a wired network (2);
   - a microcontroller (6) which,depending on the data traffic present on the first or the second adaptor, services a circuit to provide the data connection channel (8,9) between the first and the second adaptor and the computer (3) in which the card is incorporated.

2. An interface card according to claim 1, **characterized in that** the microcontroller (6) serves at least a circuit for the provision of the data connection channel (9) between the second adaptor (5) and the computer (3) in which the card is incorporated, when data traffic is present on both the first and the second adaptor.

3. An interface card according to claim 2, **characterized in that** the microcontroller (6) services two separate data connection channels (8, 9) between the first and the second adaptor, respectively, and the computer (3) in which the card is incorporated, when data traffic is present on both the first and the second adaptor.

4. A computer provided with an interface card according to one of the claims 1-3, **characterized in that** the computer is incorporated in a wireless local area network (LAN), wherein the first adaptor (4) on the interface card (10) is switched with to provide the data connection channel (8) to said LAN, and the second adaptor (5) is switched to provide a further data connection channel (9) to a wired network (2).

5. A computer according to claim 4, **characterized in that** the same is connected as access point for the wireless local area network.



European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 20 0981

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	WO 93 19423 A (INTERSOFT SYSTEMS INC) 30 September 1993 (1993-09-30) * page 3, line 5 - line 34 * * page 12, line 24 - page 14, line 25; figure 4 *	1-5	H04L12/28 G06F13/40
X	US 4 991 197 A (MORRIS WALKER C) 5 February 1991 (1991-02-05) * column 1, line 40 - column 2, line 29; figure 1 * * column 7, line 9 - line 46 *	1	
A		2-5	
A	PARKER J: "A REVOLUTION IN DISTRIBUTION. BAR-CODE READERS AND RADIO TRANSMITTERS ARE THE UNLIKELY HEROES" INFORMATIONWEEK, no. 339, 23 September 1991 (1991-09-23), page 36, 40 XP000560061 ISSN: 8750-6874 * page 36, left-hand column, paragraph 1 - middle column, paragraph 2 *	4	
A	US 5 790 536 A (DANIELSON ARVIN D ET AL) 4 August 1998 (1998-08-04) * column 8, line 61 - column 9, line 29; figure 1C *	5	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)
H04L
G06F
H04M

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	14 July 2000	Brichau, G

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 00 20 0981

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

14-07-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9319423 A	30-09-1993	AU 3924593 A	21-10-1993
US 4991197 A	05-02-1991	AU 4310289 A	02-04-1990
		BR 8907632 A	14-05-1991
		EP 0387338 A	19-09-1990
		WO 9003076 A	22-03-1990
US 5790536 A	04-08-1998	US 5657317 A	12-08-1997
		US 5568645 A	22-10-1996
		US 5555276 A	10-09-1996
		US 5602854 A	11-02-1997
		US 5365546 A	15-11-1994
		US 5052020 A	24-09-1991
		AU 700800 B	14-01-1999
		AU 3145895 A	22-02-1996
		AU 715628 B	03-02-2000
		AU 9815198 A	04-03-1999
		CA 2195661 A	08-02-1996
		EP 0784893 A	23-07-1997
		WO 9603823 A	08-02-1996
		US 5726984 A	10-03-1998
		US 5949776 A	07-09-1999
		US 5805807 A	08-09-1998
		US 5671436 A	23-09-1997
		US 5987499 A	16-11-1999
		AU 6987694 A	12-12-1994
		WO 9427382 A	24-11-1994
		CA 2184811 A	08-09-1995
		WO 9524074 A	08-09-1995
		US 5912926 A	15-06-1999
		US 5696903 A	09-12-1997
		AU 696841 B	17-09-1998
		AU 5986994 A	19-07-1994
		CA 2152598 A	07-07-1994
		EP 0681762 A	15-11-1995
		WO 9415413 A	07-07-1994
		US 5673031 A	30-09-1997
		US 5708680 A	13-01-1998
		US 5844893 A	01-12-1998
		US 5940771 A	17-08-1999
		CA 2162722 A	24-11-1994
		US 6006100 A	21-12-1999
		AT 154181 T	15-06-1997
		AU 641541 B	23-09-1993
		AU 8326291 A	18-02-1992
		CA 2066587 A	26-01-1992

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 00 20 0981

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

14-07-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5790536 A		DE 69126417 D	10-07-1997
		DE 69126417 T	05-02-1998
		EP 0494298 A	15-07-1992
		EP 0752763 A	08-01-1997
		ES 2104716 T	16-10-1997
		WO 9202084 A	06-02-1992
		US 5872354 A	16-02-1999
		US 5544010 A	06-08-1996
		US 5834753 A	10-11-1998
		US 5949056 A	07-09-1999
		US 5644471 A	01-07-1997

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82